DOCUMENT RESUME

ED 194 397 SO 012 912

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TITLE MACOS: Its Empirical Effects Versus Its Critics.
INSTITUTION Kentucky Univ., Lexington. Dept. of Educational Psychology.
PUB DATE 1 Sep 80
NOTE 39p.; Paper presented at Annual Meeting of the American Psychological Association (Montreal, Quebec, Canada, September 1, 1980). Sponsored by the University of Kentucky's Research Foundation.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Educational Research; Elementary Education; Grade 5; *Process Education; *Program Evaluation; *Social Studies; *Student Attitudes; *Teacher Attitudes
IDENTIFIERS *Man A Course of Study

ABSTRACT

Results of a study of a fifth grade social studies curriculum "Man: A Course of Study" (MACOS) are reported. MACOS is a process oriented curriculum which emphasizes the development of highly generalizable thinking and feeling skills. The sample consisted of 242 classrooms randomly selected across the United States. MACOS was compared with another process curriculum "House of Ancient Greece" (HOAG) and with conventional social studies curricula. Teachers were measured according to their value positions with respect to traditional or process-oriented approaches, attitudes concerning human relations, functional approach to pupil control in the classroom, and knowledge and application of process education methodology. Student measurements included involvement in process education learning patterns, activities, and roles; degree of expressional fluency; and degree of enthusiasm and positive regard for social studies. Results indicate that students in MACOS classrooms adopt more active and self-directed learning roles, exhibit more positive attitudes about social studies, and are more fluent and enthusiastic about social studies than children in conventional classrooms. Teachers in MACOS classrooms adopt more facilitative roles which support inquiry behavior and encourage greater intrinsic motivation on the part of students. The conclusion is that MACOS and HOAG, which also tested out favorably, can do much to show teachers, pupils, parents, and communities how to carry out quality instruction. (Author/KC)

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MACOS: ITS EMPIRICAL EFFECTS VERSUS ITS CRITICS

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Running head: MACOS A paper presented at the American Psychological Association annual meeting, Montreal, Quebec, Canada, September 1, 1980.

The authors gratefully acknowledge a grant received from the University of Kentucky Research Foundation in partial support of the study reported in this paper. The organization of the study, the opinions expressed, and the findings reported are solely the responsibility of the authors and not the Foundation.

Introduction

Man: A Course of Study (MACOS) is a 5th grade social studies curriculum based upon Jerome Bruner's theories of learning and development. Its content is anthropology, specifically the comparison of the social and individual behaviors of humans and animals in different environmental and social settings toward raising questions about and explaining social behaviors and customs across different groups. Previous studies show that, when measured by typical achievement tests children who study MACOS learn as much as students enrolled in traditional social studies curricula. The present study, based upon national samples of MACOS and control classrooms, show that children in MACOS classrooms adopt more active and self directed learning roles, exhibit more positive attitudes toward social studies, and are more fluent and enthusiastic about social studies than children in conventional social studies programs. In addition, teachers in MACOS classrooms also adopt more facilitative roles which support inquiry behavior and encourage greater intrinsic motivation on the part of students. The adoption of these roles appears to be based upon the organization of the curriculum materials

which allow teachers to behave in new and more effective ways. There are no differences in the basic educational and human relations values of teachers in MACOS or traditional social studies curricula.

Yet, MACOS is seen as an evil curriculum by a sizable group of conservative Americans who have successfully organized and prevented the National Science Foundation and other federal agencies from continuing development, dissemination, and study of MACOS or similar educational programs. This special interest group is generally opposed to psychology and other social/behavioral sciences and actively seeks to prevent the application of these sciences to the improvement of education, mental health care, and other human and social service activities. The MACOS case is interesting because it provides clear evidence that such groups can be very effective in the prevention of well formulated applied social science to the improvement of educational or other types of social and human services.

This study examines the empirical effects of the MACOS curriculum on selected variables against the intentions of the program developers and the criticisms of

the program's opponents. Two process education social studies curricula: Man: A Course of Study (MACOS) and House of Ancient Greece (HOAG); were studied to determine their impact upon teacher and pupil classroom behavior compared to a control group of conventional social studies curricula. Previous empirical studies of HOAG have shown that it is effective in changing pupil and teacher classroom behavior toward roles consistent with the theory of process education (Ritz, 1977; Ronchi, Nickse, & Ripple, 1971). For this reason the HOAG curriculum was judged as an appropriate comparison curriculum for MACOS. Although it is a considerably shorter program, lasting for only about three weeks or a month compared to the whole academic year duration of MACOS, HOAG is also designed for use at the 5th or 6th grade level. Its content is archeology presented in an active exploration format. The goals and methods of the two social studies curricula are similar.

In the present study, eight performance and attitudinal measures were administered to teachers and students in national random samples of each group (total classrooms = 242). Teacher knowledge and application

of process education methodology; student exhibition of process education roles; student expressional and ideational fluency; and student regard for social studies were all much greater for the MACOS and HOAG groups than for the CONTROL group.

Problem Statement

The broad objective for the study was to determine the impact of a well-designed process curriculum on teacher and student attitudes and classroom behaviors relative to one other process curriculum and a traditional curriculum control group for a similar content area.

The Man: A Course of Study (MACOS) social studies curriculum was compared to the House of Ancient Greece (HOAG) social studies program and an array of traditional curricula in social studies. Both MACOS and HOAG exemplify the design principles of process education (Seferian & Cole, 1969; Cole, 1972). Specific comparisons of curricular effects were made across the following variables:[1]

A) Teachers' value positions with respect to process-oriented or more traditional content-oriented educational philosophies (measured by the Educational Preference

Scale (EPS), r = .829).

B) Teachers' attitudes concerning human relations and support granted students (measured by the Student/ Teacher Attitudes toward Human Relations scale (STAHR), r = .792).

C) Teachers' functional approach to pupil control in the classroom (measured by the Pupil Control Ideology scale (PCI), r = .811).

D) Teachers' knowledge and application of process education methodology and teaching-learning roles (measured by the My Opinion of Social Studies questionnaire (MOP), r = .687).

E) Students' involvement in process education learning patterns, activities, and roles (measured by the My Ideas about Social Studies questionnaire).

F) Students' degree of expressional fluency (EF) and ideational fluency (IF) to open-ended questions about their social studies curriculum (measured by content analysis of written responses, interjudge reliabilities = .999 and .876 respectively).

G) Students' degree of enthusiasm and positive regard for social studies (PR) (measured by content

analysis of written responses and Likert scale items, interjudge reliability for content analysis = .879).

Theoretical Framework

Process education emphasizes the development of highly generalizable thinking and feeling skills. In contrast, the primary goals of more conventional curricula focus on the acquisition and retention of a body of "essential" facts and concepts. In process curricula, goals concerned with specific content become secondary to goals concerned with pupils' developing skills in information processing, meaning making, evaluating, and generalizing. Both MACOS and HOAG are explicitly designed to promote process education teaching-learning roles for pupils and teachers. While HOAG remains generally unknown to educators, MACOS has become "infamous" largely because of polemics by James J. Kilpatrick in his newspaper column, John B. Conlan (1975), and citizen groups opposed to what they believe to be "un-American" and "un-Christian" textbooks (Hefley, 1976, pp. 113-114). The results of these and other irrational and empirically unfounded accusations about the suppossedly evil intent and effect of the MACOS

curriculum has been the termination of National Science Foundation activities toward the further development, implementation, and study of MACOS and other process curricula as well (Schaar, 1975a, 1975b).

Previous empirical studies of MACOS have established that the program results in the same general level of achievement by students on standardized achievement tests as do other more conventional curricula in social studies (Cort, & Perkowitz, 1977; Deffenbaugh, Dalfen, & Ripple, 1970). Furthermore, both of these studies showed that students and teachers generally express very positive attitudes towards the curriculum, a finding which is not very frequent with students in more conventional social studies programs. Other major studies of the effectiveness of process education curricula on student achievement have been carried out (Phillips, 1978). However, previous studies have not addressed role differences of teachers and students and other process outcome variables similar to those under study here, and have not compared MACOS with another similar process curriculum.

Method and Data Sources

Students and teachers in classrooms using MACOS

were compared to students and teachers in HOAG and control classrooms across the vector of 8 measures listed on page three. Lists of school districts using MACOS and HOAG were obtained from the curriculum distributors. A random sample of classrooms was drawn from across states and districts from these listings. The CONTROL classrooms were randomly selected from across states and districts from The School Universe Data Books (1976), a listing of all school districts in the United States. Permission was obtained from school administrators by an initial letter and a follow-up telephone call to contact a social studies teacher in their district. These teachers were then provided with a complete set of instruments and instructions for their administration to themselves and their students. The rate of return of properly completed instruments was approximately 60% across all three groups, resulting in totals of 141 MACOS, 65 HOAG, and 36 CONTROL classrooms being included. Classrooms were the basic unit of analysis. Each teacher completed the EPS, STAHR, PCI, and MOP measures. Three student observers in each classroom completed the MI, EF, IF, and PR measures. A one-way fixed effects MANOVA was per-

formed across the three groups and the 8 dependent variables. It was hypothesized that the MACOS and HOAG classrooms would score significantly higher on the entire vector of dependent variables.

The three student observers in each classroom were not randomly selected. Rather, the teacher was instructed to select the three "best" students in the classroom with respect to their performance in the social studies curriculum. Teachers were instructed to interpret "best" as those three students who most exemplified the behavior and accomplishments the teacher valued as an outcome of instruction for the particular social studies curriculum in use. The same procedure was followed for the CONTROL group, the MACOS group, and the HOAG group. There were two reasons for this non-random selection of student observers in classrooms.

First, it was felt that many teachers would not be inclined to apply an unbiased random sampling of three student observers from their classrooms even if provided with the means to do so. Therefore, it was decided to make the procedure non-random but consistent across all classrooms.

Second, it was felt that teachers would select those particular students that they judged to best exemplify the appropriate student roles within the framework of the social studies curriculum in use. Therefore, the responses of these three "best" students selected by the teacher would reveal much about the teacher's perception and understanding of the appropriate student role in the teaching-learning activity. This strategy yielded a student sample which behaved in ways the teacher viewed as appropriate and would, therefore, try to promote among all students.

It was recognized that the selection procedure for student observers would bias the results of the study in systematic ways and restrict the generalizability of the findings to a more inclusive population of fifth and sixth grade students enrolled in elementary school classrooms social studies curricula.

Results and Conclusions

The overall multivariate test for equality of mean vectors for the three groups across the eight variables is highly significant ($F_{(16,434)} = 11.47$, $p < .001$).

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Insert Table 1 about here

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Examination of the univariate and step-down F-ratios indicate that the three groups do not differ significantly in terms of teachers' value orientations and educational philosophies (EPS), nor do they differ in terms of teacher attitudes toward positive human relations and support toward students (STAHR). Large differences are found, however, favoring HOAG and MACOS classrooms over CONTROL classrooms on each of the remaining measures: teacher knowledge and application of process education methodology (MOP); student adoption of process education learning roles (MI); student expressional fluency (EF) and ideational fluency (IF); and general student enthusiasm and positive regard for the program and the subject matter (PR). The magnitude of these latter differences is larger (See Figures 1-5).

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Insert Figures 1 through 5 about here

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It is concluded that both MACOS and HOAG bring about no major changes in basic values of teachers toward

process or conventional education, nor do changes in attitudes regarding human relations and supportiveness toward students necessarily result. However, experience with these programs does appear to change the functional classroom management practices and "control ideology" of teachers, as well as to bring about major changes in the classroom behavior of both pupils and teachers. These behavioral differences involve: the primary method of learning and study engaged in by students (mutual, co-operative, and oriented toward direct experience versus individual, competitive, and oriented toward textbook reading and study only); the degree of self-directed student involvement in learning activities and in teaching and learning from other students (from maximum to little involvement); and mobility, locus of responsibility, and general student participation in learning activities within the classroom (from much to little). Large differences also appear in the degree of pupil expressional and ideational fluency based upon written responses to open-ended questions about the social studies curriculum. Similar large differences also appear in the degree of enthusiasm and positive regard

students hold for their social studies curriculum. In both cases MACOS and HOAG far excell more traditional social studies programs.

Discussion of the Results and Their Significance

This research is significant in several respects. First, it is the only study to-date to examine MACOS -a very controversial curriculum- on a wide range of process as well as outcome measures and to compare the results for MACOS to those of another carefully designed and similar process curriculum (HOAG). The CONTROL classrooms in this study function as an additional standard by which to judge the effects of the two process curricula.

It is surprising that the HOAG classrooms scored even higher than MACOS classrooms on teacher's knowledge of process education methodology, mean classroom process role scores reported by students, and the degree of student enthusiasm and positive regard for the course (see Figures 1,2, and 5). HOAG is typically taught for about 40 to 45 minutes a day for a period of 3 to 4 weeks. The teachers in the HOAG sample reported this same pattern and duration of teaching. MACOS is taught for a similar period of 40 to 45 minutes daily throughout the entire

year, which is approximately a duration of 9 or 10 times the total teaching time for HOAG. Yet the effects of the HOAG on the measures used in this study are striking. There are two probable reasons for this. First, the students and teachers in the HOAG sample were cued to recall their experiences in social studies instruction during the time they were studying the HOAG curriculum. Second, the HOAG curriculum is extremely well organized and developed. Other studies have shown it has a potent and lasting effect upon the pupils and teachers who experience it (Ritz, 1977; Ronchi, Nickse, & Ripple, 1971). It may be that a series of experiences with very well designed but fairly short units of instruction can be highly effective in terms of introducing teachers and students to a variety of new and more effective learning roles and patterns. Of course, in the present study, nothing is known about the degree to which these patterns persisted and transfered to other areas of the curriculum in the absence of the particular curriculum materials under study.

The much larger levels of pupil expressional and ideational fluency for the MACOS classrooms in response

to 2 open-ended questions about their social studies program may be explained in part by the fact that the longer duration of the MACOS program compared with the shorter HOAG program gave students more to write about. In addition specific content of MACOS deals more closely with a wider array of topics related to daily affairs of children (e.g. animal behavior, parenting, learning, communication, etc). The fluency of children in both programs greatly exceeded the levels achieved in the CONTROL classrooms which were also a year in duration. These fluency scores should be interpreted as the degree of interest and enthusiasm students felt for their social studies program and the committment they expended in writing about their experiences. There is no reason to believe that the children in the MACOS and HOAG classrooms are any more creative than those in the CONTROL classrooms, only that they were stimulated to expend more effort and to write more fully about their experiences and ideas.

A second major implication of this study concerns the effectiveness of the curriculum materials themselves. The results presented in Table 1 and Figures 1 through 5

suggest that the developers of MACOS and HOAG may have achieved the intended process learning outcomes planned for these curricula. This is an unusual finding. In a study of curriculum innovations developed between 1957 and 1967, Goodlad and Klein (1970) conducted a series of detailed observations and ethnographic studies in 150 elementary classrooms across 26 school districts in 13 states. All schools were located in or adjacent to large urban areas. The researchers found that the changes educators believed to be taking place in classrooms because of the new programs were not occurring. Teachers and children were behaving no differently than they had before these new programs had been installed. The authors concluded that the expectations of the program developers had been "blunted on the school and classroom door" (Goodlad & Klein, 1970, p. 97). In their concluding chapter the authors recommend that to have an impact, curriculum innovations ought to include well designed and packaged learning materials which could serve to help teachers and students engage in the roles intended by the curriculum developers. Without such concrete and readily available props, the exciting ideas of the

curriculum developers can easily be translated into habitual and unexciting formats such as teacher directed and dominated question and answer sessions, worksheet completion, and individual student reading of material in the interest of answering narrow and convergent thinking questions of a factual nature.

In reviewing the findings from the present study, Goodlad suggests that the MACOS curriculum does not suffer the same fate as most other curriculum innovations of its period because of the contervailing character of its instructional materials.[2] The same argument can be made for the HOAG curriculum. Both curricula were explicitly designed to provide teachers and children with a wide variety of physical materials, attractive visual experiences, and a wealth of exciting and imaginative simulation activities, games, films, and small group activities and projects. This ability of a curriculum to physically impart appropriate changes in teacher and pupil classroom behavior more in keeping with the practice of process education has been called "provisioning" (Walberg & Thomas, 1972). It is hypothesized that a well provisioned curriculum fosters teacher and pupil

behavior which would otherwise be unlikely in the absence of the props, physical materials, and well planned and tested learning activities which comprise the focus of instruction. It is apparent from a study of the source documents for MACOS and HOAG, as well as from direct examination of the curriculum materials themselves, that both are extremely well provisioned (Bruner, 1966; Bruner & Dow, 1967; Sefarian & Cole, 1969; Krasse, 1968). The HOAG program is even more fully provisioned than MACOS. This may also help explain the superior results for HOAG compared to MACOS on the dimensions of teacher knowledge of process education roles (Figure 1), mean classroom process role scores of students (Figure 2), and student enthusiasm and positive regard for the curriculum (Figure 5).

The HOAG curriculum is so well provisioned that the teacher needs to do little to implement the program other than bring in the kit, open it up, assign a student or students to hand out the materials, and group the children in the class into the several study teams. Further attempts to improve HOAG by more detailed teacher instructions and the addition of specific be-

havioral objectives for children appear to have been counter productive. An empirical study of 30 classrooms in three states studied the effectiveness of an augmented version of HOAG. Teachers in the 16 experimental classrooms were provided with a detailed set of performance objectives for students and detailed instructions on how to teach the unit. On a variety of measures the augmented version functioned no better than the standard version of the very simple teacher's guide which the developers provide. While both groups used the physical materials in the HOAG MATCH Kit, the teachers in the augmented version were reported to use a predominant pattern of question and answer classroom discussion rather than the other more individualized, small group, and self-directed modes of study intended by the HOAG developers (Ritz, 1977, p. 398). The Ritz study also established that the HOAG classrooms, when compared with a normative group of other elementary classrooms, showed statistically significant and substantially higher scores on the dimensions of "creativity", "individualization of instruction", and "group activity" as measured on the Vincent classroom observa-

tion instrument Indicators of Quality. All students and teachers, as well as many parents, who had been exposed to the program were found to be very enthusiastic about the course. The findings of the large and statistically significant differences in favor of HOAG and MACOS classrooms over CONTROL classrooms in the present study reported in Table 1 and Figures 1 through 5 are consistent with Ritz' earlier study.

A third significant implication of the present study concerns the issue of teacher training. Although the MACOS teachers in this sample were quite experienced as teachers ($\bar{X}$ = 9.04 years, S.D. = 7.12), few of them had more than a few days of formal inservice training for the teaching of MACOS. Most had been teaching MACOS for a period of 3 to 5 years. None had been extensively trained in the long programs of summer and year long inservice education common in earlier times (Goodlad & Klein, 1970, p.4). The same pattern was observed for the HOAG teachers who were more experienced in teaching generally ($\bar{X}$ = 13.34 years, S.D. = 7.72), but none of whom had any formal inservice training in preparation for teaching the course. Most HOAG teachers had also

taught the course for a period of 3 to 5 times. Even without extensive formal inservice training both groups implement the curriculum very well as judged by their performance on knowledge measures and as judged by the responses of the students they selected when reporting on common classroom practices and behavior patterns of both students and teachers. Apparently the curriculum developers for both programs have organized the materials well and provided sufficient guidance for teachers and students to implement the programs properly. The good physical provisioning of the the two programs is probably responsible in large part for these outcomes. It is probably difficult to translate the goals and activities of these two programs into dull and unimaginative formats of instruction given the wealth of stimulating instructional materials and activities which are present.

A fourth implication concerns the long term effects of curriculum experiences similar to HOAG and MACOS on student achievement. The altered classroom behaviors and attitudes of teachers and students together with the increased positive regard for social studies, and perhaps for school and study generally, may have long term effects

on achievement of students. Kifer (1975) found that student achievement and self-esteem are highly related. Earlier studies have established that both MACOS (Hanley, Whitla, Moo, & Walters, 1970) and HOAG (Ronchi, Niskse, & Ripple, 1970) result in children who usually perform poorly in academic areas improving both their academic and social performance. Bloom (1976) and others suggest that increased active participation in learning activities, success, enjoyment, and increased quality of instruction can all lead to increased student achievement in the long run and to increased self-esteem and general capability or competence as well. Nicholls (1979) argues that effective teaching requires careful attention to students' motivational cues toward maintaining optimum motivation levels in all children. He also notes that certain topics and tasks have a propensity for developing a strong intrinsic or endogenous motivation which leads students to cooperate rather than compete, to strive toward acquisition of knowledge and competence, and in the face of failure to ask, "In what ways might I learn to master this task?" rather than to conclude, "I am stupid because I cannot do the task as well as

others". In MACOS, HOAG, and similar well developed curriculum products, there is much practical knowledge of how to organize and provision instruction toward the ends suggested by Nicholls.

Oftentimes persons in positions of responsibility have concluded that these newer curricula have no real value since when compared to more traditional curricula on standardized achievement tests, there are typically no differences in the performance of students in the two groups. There are two problems with such interpretations. First, it is well known that the developers of standardized achievement tests take great pains to insure that the items developed are not sensitive to treatment differences in curriculum materials per se. The total reliance of decisions about the value of these newer programs in terms of their having to show superior performance on standardized achievement measures is a criterion which is unreasonable and which misses many important outcomes which may result from these programs. A second problem is that these comparative studies are almost always completed over a short period of time, seldom for more than a year or two. Studies of student achievement on

standardized tests over a series of years with students who have been repeatedly exposed to a series of highly potent curriculum materials and experiences similar to MACOS and HOAG might yield quite different results. Many positive school experiences with well provisioned curricula may cumulate into large long term effects in the area of students' academic and personal competence. This is a point central in the thinking of Bloom (1976) and Nicholls (1979) in their discussions of what is required for effective schooling, although neither discusses the topic of specific curriculum approaches in detail.

A final implication concerns how easy it is for special interest groups to influence national policy in educational R & D. The important involvement of the NSF in the development, dissemination, and study of MACOS and other process curricula has been terminated because of the activities of a small but vocal group of right-wing protestant fundamentalists. The polemics of this group coupled with letter writing campaigns and influence in Congressional committees have prevented the conclusion of major R & D efforts in curriculum

design activities devoted to the task of educating the population to higher levels of scientific literacy. The organized groups who oppose MACOS do so because they believe it fails to indoctrinate youth in traditional American values and curriculum content. MACOS is indeed, a threat to these groups because it teaches children to think, to question, and to explore alternative logical explanations of common and problematic social behavior in the affairs of people. Yet, the solutions to complex problems lie in new perceptions, divergent response and creative adaptations to a rapidly changing world as well as in a certain stability of tradition and values. A standard Federal imposed curriculum is not desirable because it would lessen the diversity which exists in the educational practices of local communities. Diversity is a basic strength of the United States which results in many adaptive solutions to complex problems. However, in MACOS and other similar curricula, the Federal government was not seeking to impose a national curriculum. Rather it was assisting in much needed R & D about how to make classroom instruction more interesting, meaningful, and effective. Schools and communities are free

to use the products of this effort if they choose. There was no coercion. In any event, the most appropriate use of MACOS, HOAG, and the few other carefully developed curriculum materials of a similar nature, is not as a massive and rigid installation of a total curriculum to be followed in some exact sequence. Rather it is the flexible use of these few excellent curriculum innovations, reflection upon how and why they work so well to improve the overall enthusiasm of students and teachers, and conscious effort to extract from these few experiences some generalizable principles and techniques which can be used by local educators and communities to improve instruction in all areas generally. MACOS, HOAG and programs similar to those described by Seferian and Cole (1969) can do much toward showing teachers, pupils, parents, and communities how to carry out high quality instruction.

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FOOTNOTES

[1]The outcome measures used in the study were carefully selected and developed to be sensitive to the main effects of the two curricula as postulated by their developers. The Educational Preference Scale (EPS) is a measure of teacher preference for "process" or "content" approaches to instruction. Details about the instrument may be found in:

> Lacefield, W.E. & Cole, H.P. Starting point for curricular change: A predisposition and suitability measure for client groups. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA, Feb. 27, 1973 ED075915.

The Pupil Control Ideology (PCI) scale has been widely used to measure the degree to which teachers are petty, bureaucratic, and over-controlling in classroom management versus nurturant, facilitating, and understanding of children. Details about the measure may be found in:

> Willower, D.J., Eidell, T.L., & Hoy, W.K. The school and pupil control ideology. The Pennsylvania State University Studies, No. 24. Univer-

sity Park: The Pennsylvania State University, 1973.

The Student/Teacher Attitudes of Human Relations Scale (STAHR) was developed by Dr. Betty Jean Murad and the first author of this paper. It is a measure of the degree to which the teacher attempts to provide a supportive learning environment for students in their classrooms across eight major dimensions. The development of this scale was based on the work of Walberg and Thomas (1972). Details about the STAHR may be found in:

Murad, B.J. A Study of the effects of a teacher education program on dimensions of teacher trainees' professional ideology, attitudes, and values. Unpublished doctoral dissertation. University of Kentucky, Lexington, Kentucky, 1974.

The other measures were developed specifically for this study, although earlier versions of the teacher knowledge instrument, My Opinion of Social Studies (MOP) and the student process role, My Ideas About Social Studies (MI) instrument, had been developed by the first author and colleagues and used in earlier studies at the Eastern Regional Institute for Education.

The teacher measure (MOP) tests for knowledge of process education teaching methodology. The pupil

measure (MI) is a 14 item classroom observation scale consisting of concrete behavioral items upon which student observers report frequencies of their peers and teacher behavior.

The student expressional fluency (EF), ideational fluency (IF), and positive regard for social studies (PR) measures were developed specifically for this study. They consisted of two open-ended questions to which students were invited to respond in writing. The questions were:

1) "I think social studies is . . . . ."

2) "I feel this way because . . . . . ."

Students' responses were typed verbatum. The length of the total written response to the nearest millimeter was taken as a measure of simple expressional fluency. The number of ideas expressed in each pupil's written response was counted and coded as ideational fluency. The weighted combination of positive, neutral, and negative statements or judgments made by students was coded as degree of positive regard.

All reliabilities reported on pages 5 and 6 are KR20 generalizability coefficients unless otherwise noted.

[2]Personal communication to the first author by letter from Professor Goodlad, May 28, 1980.

Table 1

MANOVA Results for 8 Dependent Variables Across Three Social Studies curricula: HOAG, MACOS, and a CONTROL.

Multivariate F-ratio = 11.47; dfs = 16,434; $p < .0001$

Dependent Variable	Univariate F-ratio (df=2,224)	Significance
Educational Preference Scale (EPS)	1.92	.1483
Attitudes of Human Relations (STAHR)	1.23	.2937
Pupil Control Ideology (PCI)	3.08	.0480
Process Methods & Practice (MO)	44.43	.0001
Student Method & Role of Learning (MI)	11.84	.0001
Student Expressional Fluency (EF)	18.12	.0001
Student Ideational Fluency (IF)	11.55	.0001
Student Regard for the Subject Matter (PR)	15.23	.0001

Multivariate and univariate planned contrasts established that HOAG and MACOS groups were superior to the CONTROL group on all significant dependent measures.

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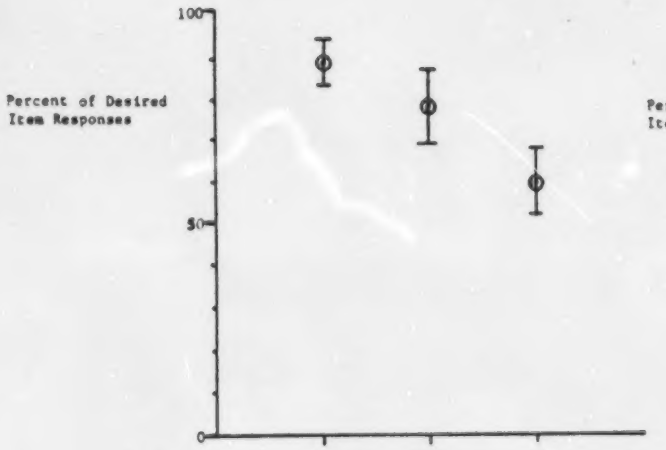
Figures 1-5: Graphic and tabular presentation of results for selected measures across the three curricular treatment goups: HOAG, MACOS, & CONTROL.*

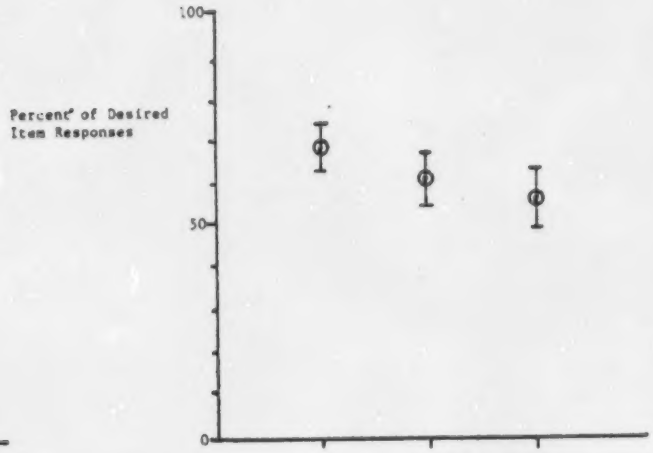
Figure 1 : Teachers' Knowleige of process education teaching methods and learning roles (MOP).



Group	HOAG	MACOS	CONTROL
N	62	130	35
Mean	88.69	77.40	58.19
Std.Dev.	10.00	16.50	14.96

Univariate analysis: $F_{2,224} = 44.43$; $p < .0001$
HOAG vrs CONTROL: $F_{1,224} = 44.48$; $p < .0001$
MACOS vrs CONTROL: $F_{1,224} = 44.37$; $p < .0001$

Figure 2 : Mean classroom process role scores as reported by students.



Group	HOAG	MACOS	CONTROL
N	65	111	36
Mean	68.49	60.22	55.17
Std.Dev.	9.76	14.80	13.66

Univariate analysis: $F_{2,224} = 11.84$; $p < .0001$
HOAG vrs CONTROL: $F_{1,224} = 16.51$; $p < .0001$
MACOS vrs CONTROL: $F_{1,224} = 7.16$; $p < .0080$

* Reported sample sizes may vary slightly due to missing data. Group means are plotted as encircled points. Group standard deviations are plotted as vertical lines centered on group means.

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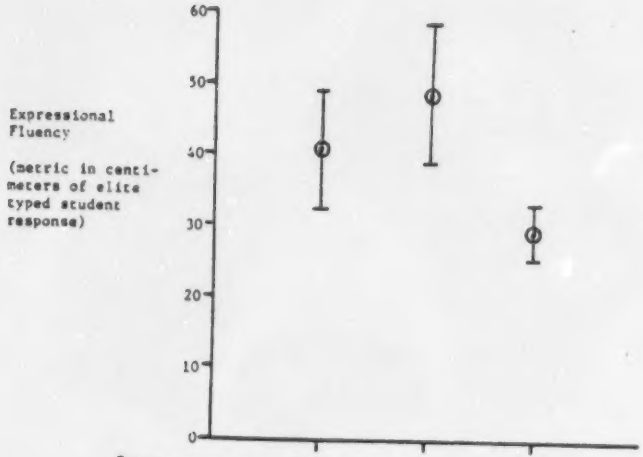
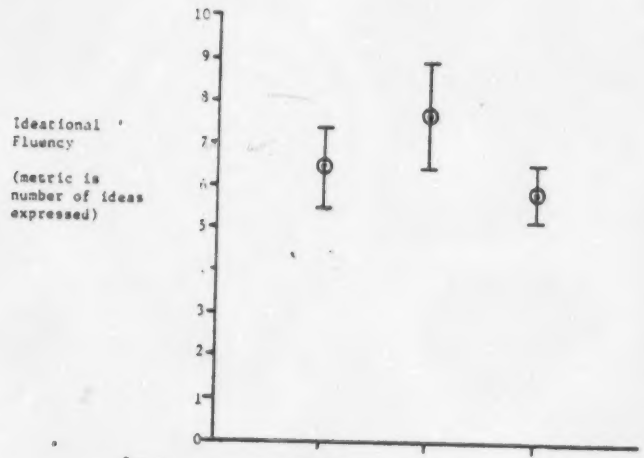
Figure 3 : Student Expressional Fluency.



Group	HOAG	MACOS	CONTROL
N	62	130	35
Mean	41.00	48.63	29.34
Std.Dev.	16.19	19.40	8.43

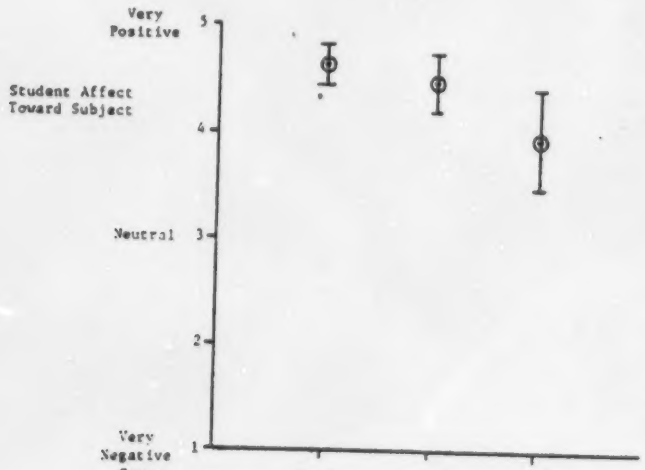
Univariate analysis: $F_{2,224} = 18.12$; $p < .0001$
HOAG vrs CONTROL: $F_{1,224} = 1.86$; $p < .1737$
MACOS vrs CONTROL: $F_{1,224} = 34.38$; $p < .0001$

Figure 4 : Student Ideational Fluency.



Group	HOAG	MACOS	CONTROL
N	62	130	35
Mean	6.37	7.68	5.90
Std.Dev.	2.17	2.57	1.55

Univariate analysis: $F_{2,224} = 11.55$; $p < .0001$
HOAG vrs CONTROL: $F_{1,224} = 7.20$; $p < .0079$
MACOS vrs CONTROL: $F_{1,224} = 15.89$; $p < .0001$



Group	HOAG	MACOS	CONTROL
N	62	130	35
Mean	4.64	4.43	3.93
Std.Dev.	.462	.586	.878

Univariate analysis: $F_{2,224} = 15.23$; $p < .0001$
HOAG vrs CONTROL: $F_{1,224} = 12.45$; $p < .0006$
MACOS vrs CONTROL: $F_{1,224} = 19.02$; $p < .0001$

Figure 5 : Student Enthusiasm and Positive Regard for the subject matter and the course.